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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT

CD NO

COUNTRY East Germany

DATE DIST 3 September 1954

SUBJECT Production of a Goniometer Direction Finder by VEB Funkwerk Koepenick

NO OF PAGES 4

PLACE ACQUIRED

NO OF ENCLS (LISTED BELOW)

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DATE OF INFO

SUPPLEMENT TO REPORT NO 639738

THIS IS UNEVALUATED INFORMATION

1. Development of a goniometer location finder in Funkwerk Koepenick started in May 1951 and is not yet finished. A total of 150,000 to 200,000 DMS were spent for the development and construction of the instrument from May 1951 to the end of April 1954.

3. Following are the completion dates for the instrument in its two planned versions:

Goniometer location finder I: planned sea test in July or August 1954. 25X1

Goniometer location finder II: planned transfer of the development blueprint to the Construction Department by September 1954.

4. The technical specifications of the project are:

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a. Frequency range, 200 kcs. to 3,5 mcs;
b. Location finding sensitivity: less than 50 micro V/m at one degree minimum width;
c. In all other points the installation was to correspond to the technical conditions set forth by Postal Regulations.

At the end of 1953 all technical conditions for the project were laid down in a list of assignments (Pflichtenheft) by the Projects Department (TPG) of the Funkwerk according to regulations in the East German Law Gazette and the Soviet Sea Register.

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5. The development was based on the following material available:

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a. German and foreign literature of general character concerning methods of location finding.

b. German and foreign technical literature, particularly technical literature from the Telefunken firm.

c. Several ring iron core goniometers of the Godesberg type, stemming from former German Wehrmacht supplies.

d. In the summer of 1952, the Funkwerk bought a Telegon location finder from a supply depot in Thuringia where products seized by the authorities were stored. The Telegon location finder was the newest Telefunken development at that time.

6. The development underwent several plan changes in the course of time. In the beginning the instrument was to consist of a cross loop of 15 to 20 square meters, a location-finding input stage without amplifier, and a receiver of the RFT all-wave receiver type. Late in 1952, this form of the project was abandoned because it became clear that the location-finding sensitivity would not be great enough. It was then decided that the instrument to be developed should be of the Telegon type as produced by Telefunken. In mid-1953, VEB Carl von Ossietzky, Teltow (formerly Dralowid) furnished the first useable high-frequency iron cores for the project. The instrument was to be developed in two types:

a. Goniometer location finder I, provided with a goniometer Vorsatz, with a receiver of the RFT revolving-frame location finder type;

b. Goniometer location finder II, provided with a location-finding prestage and receiver combined in one instrument and a Funkpeil[illegible]r (daughter radio direction finder) driven by a gyro compass.

7. The following are the technical data of the instrument:

a. Goniometer:

The high frequency iron core of the goniometer has a diameter of 42 millimeters, is 20 millimeters high and has a ring core permeability of 12. The diameter of the axis boring is 10 millimeters. All coils are wound on disks made of Polystyrol. In order to keep the error due to the coupling between field coil and search coil to a minimum, these two coils must form a certain angle alpha, and their windings must be distributed uniformly over sectors (see Figure 1 of attachment).
The disks of the side determination coil are glued on the high frequency iron cores. The windings are placed in slots (Nuten). The disks of the search coil are glued on the side determination coil with which they form an angle of 90 degrees. The windings of the side determination coil, as well as those of the search coil, are in parallel connection (see Figure 2 of attachment).
The disks of the field coil are kept distant from each other by a Polystyrol ring of 1 millimeter strength. While the search and side determination coils are rotatable, the winding of the field coil is in a fixed mechanical connection with the goniometer casing. The winding of the field coil is arranged in such a way that a "quarter circle" angular mistake (90 degree ambiguity) in the goniometer can be avoided (see Figure 3 of attachment).
The search and side determination coils are connected with slide rings (Schleifringe). The two winding halves of a field coil are series-connected.

b. Following are the coil designations and data of the goniometer:

1) Field coils: AB and CD
2) Search coils: FG

3) Side determination coil: ST
4) Coil data (see Figures 1 and 2 of attachment):

Coil	Alpha	Diameter in Millimeters	Height in Millimeters	Number of Windings	Inductivity (H = henrys)
AD	84°22.5'	52	36	2 x 9, serial	22 micro-H
CD	84°22.5'	52	36	2 x 9, serial	22 micro-H
FG	112°48'	45	25	2 x 24, parallel	27 micro-H
ST	112°00'	43.5	22	2 x 20, parallel	19 micro-H

c. The screening of the goniometer has a diameter of 120 millimeters and an efficient height of 55 millimeters. The coupling between field coil and search coil is 80 percent. The coupling between field coil and side determination coil is 70 percent. The coil quality (Spulenguete) of all goniometer coils is over 80 in the frequency range of 200 kcs. to 3.5 mcs.

d. For the connection of the cross frame with the goniometer, see Figure 4 of the attachment. In order to avoid resonant effects in the frame circuit at the limiting wave range (from about 2 mcs. on), two identical coils are arranged in parallel connection with the field coils of the goniometer.

e. The following are the first high frequency circuits pertaining to the reception:

1) Direction Finder Circuit (Circuit "Peilen") (see Figure 5 of attachment).
2) Sense direction finding circuit (Circuit "Seitenbestimmung") (see Figure 6 of att.
3) Circuit "Rundempfang" (see Figure 7 of attachment).

f. Antenna system:

The cross loop antenna consists of two double winding frames of 1.1 meter diameter which are at an angle of 90 degrees to each other. The inductivity of a loop is 13.5 micro-H. The auxiliary antenna is insulated in the center of the cross frame and protrudes over the frame by about 1.5 meters. The cables for the loops and the auxiliary antenna are cut to a fixed length of 7.5 meters.

g. Compensation of Funkbeschickung (radio beam deviation) is carried out through:

1) One-time lining up of the cross frame with the center of the ship and the corresponding adjustment of the goniometer indicator.

2) Putting additional inductivity on one of the two loops.

h. The receiver for goniometer location finder II had not been definitely planned as of late April 1954. The following specifications have been tentatively planned:

1) Three high frequency prestages
2) The intermediate frequency amplifier of 70 kcs. has an installation for the adjustment of band width (plus minus 0.4; 1; 4 and a 7 kcs.)
3) The receiver is to be provided with miniature tubes.

8. As of late April 1954, the main material difficulties delaying the execution of the project were the shortage of sea-water-proof aluminum tubing for the cross frame and of plexiglass for the goniometer scale.

9. The following services have shown interest in the development and obtained reports on it:

a) Russian authorities in Karlshorst.
b) East German Sea Police services.
c) East German fishery services.
d) The Czechoslovak government, which requested and obtained in 1953 the available documentary material on the development.

Attachment:

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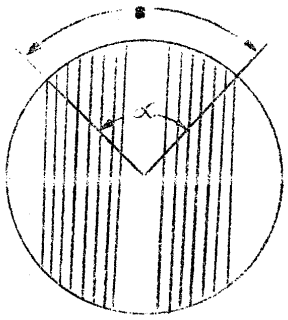
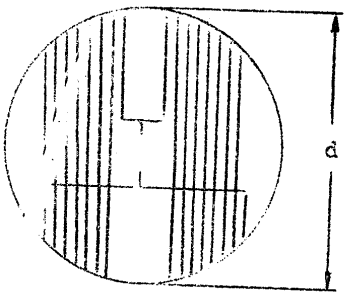


Figure 1



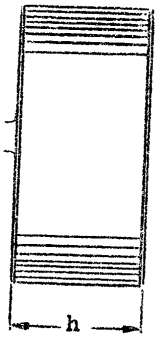


Figure 2

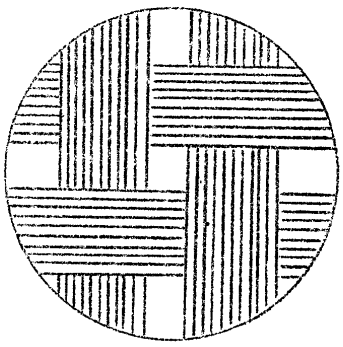


Figure 3

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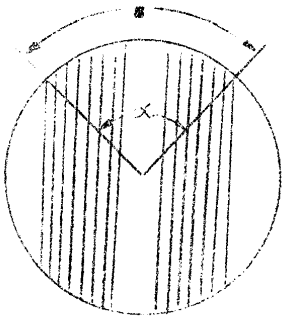
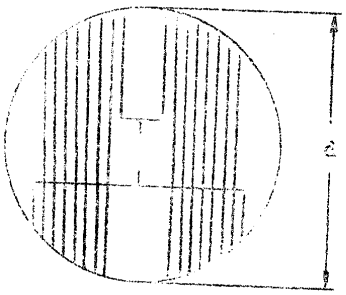


Figure 1



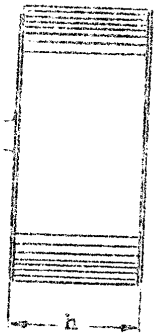


Figure 2

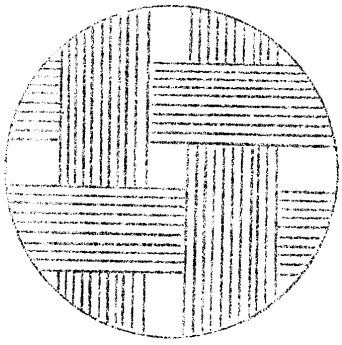


Figure 3

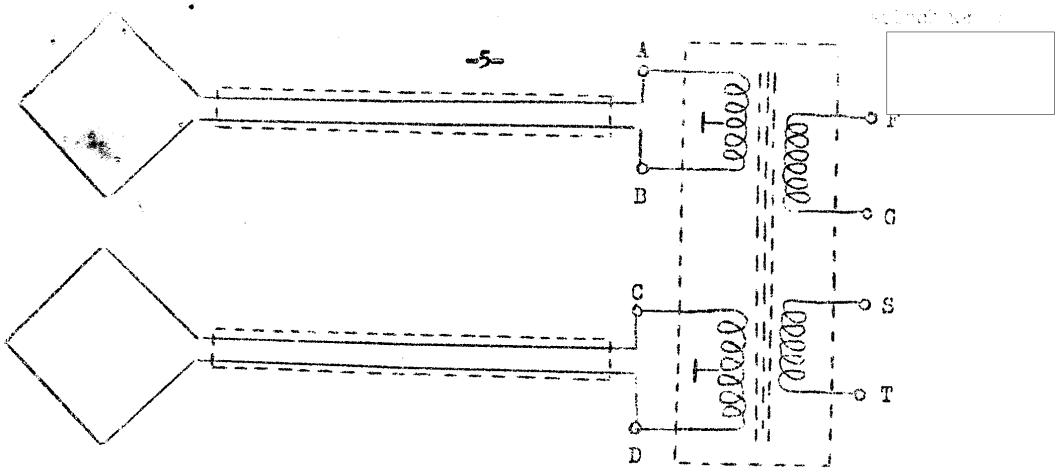


Figure 4

Direction Finder Circuit

(Circuit "Peilen")

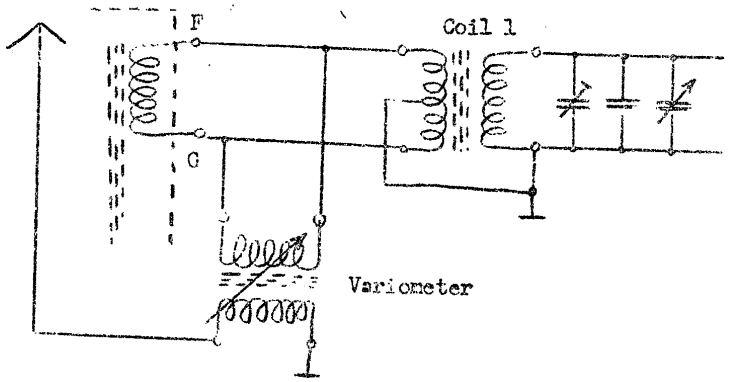


Figure 5

Circuit for Sidefinding

(Circuit "Seitenbestimmung")

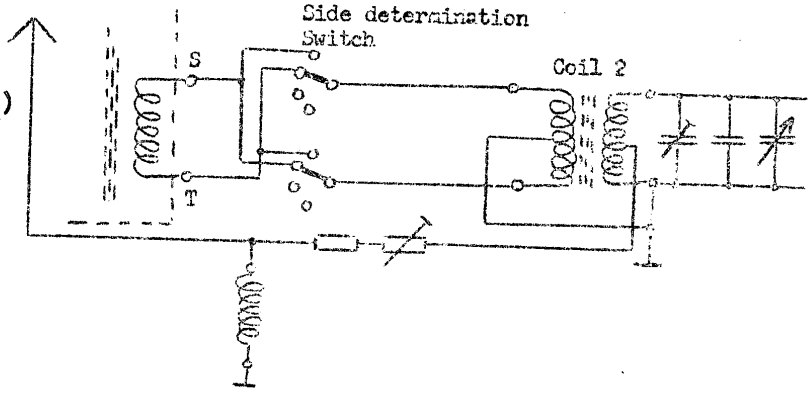
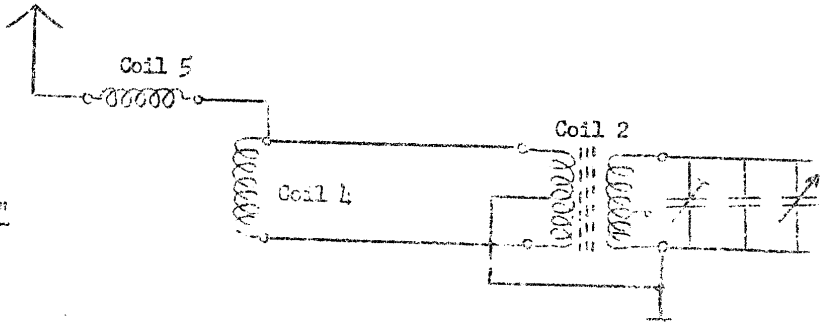


Figure 6



Circuit "Rundempfang"

Figure 7